



## PATENT ABSTRACTS OF JAPAN

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**(54) SINGLE SILICON CRYSTAL WAFER DOPED WITH BORON AND EPITAXIAL SILICON WAFER AND THEIR PRODUCTION**

(57) Abstract:

**PROBLEM TO BE SOLVED:** To obtain an epitaxial silicon wafer containing heavy metal impurities in an extremely low concentration in an epitaxial layer in high productivity by using a boron-doped single silicon crystal wafer having a low oxygen concentration and capable of easily depositing oxides.

**SOLUTION:** This boron-doped single silicon crystal wafer having an oxygen concentration of 216 ppma, a deposited oxide or oxidation-induced lamination defect density of  $21 \times 10^9$  deposits or defects/cm<sup>3</sup> after a thermal

deposition treatment, and a resistivity of 10-100 mΩ.cm is obtained by growing a single silicon crystal bar so as to contain oxygen in an oxygen concentration of 216 ppma and subsequently slicing the grown single silicon crystal bar. The single silicon crystal bar is obtained by doping a single silicon crystal with boron and further with nitrogen in a dope concentration of  $1 \times 10^{10}$  to  $5 \times 10^5$  atoms/cm<sup>3</sup> by Czochralski method. An epitaxial single silicon crystal wafer is obtained by thermally treating the above single silicon crystal wafer preferably at a temperature from 990°C to the melting point of silicon and subsequently forming an epitaxial layer on the surface layer portion of the thermally treated wafer.

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